

## REMARKS

In the Office Action the Examiner noted that claims 1-4 are pending in the application and the Examiner rejected all claims. By this Amendment, various claims have been amended and new claim 5 has been added. Thus, claims 1-5 are pending in the application. The Examiner's rejections are traversed below.

### The Rejections

In item 2 on pages 2-4 of the Office Action the Examiner rejected claims 1-4 under 35 U.S.C. § 103 as unpatentable over U.S. Patent 6,459,515 to Bergano in view of U.S. Patent 6,008,920 to Hendrix.

### The Prior Art

U.S. Patent 6,459,515 to Bergano is directed to a method and apparatus for transmitting an optical signal having a total number of channels that are dividable into a prescribed number of wavebands. Referring to Figure 1, Bergano discloses a method and apparatus to enable generation of a WDM optical signal having states of polarization wavelengths that are pairwise orthogonal. Referring to Figure 3, an optical transmitter unit 300 multiplexes optical signals of odd numbered wavelengths with a wavelength combiner 307. A wavelength combiner 308 multiplexes optical signals of even numbered wavelengths. Multiplexed light from the wavelength combiners 307 and 308 are provided to a polarization combiner 315 which combines the light from the two wavelength combiners.

U.S. Patent 6,008,920 to Hendrix discloses a multiple channel optical multiplexing/demultiplexing device. Figure 1 illustrates an apparatus for multiplexing/demultiplexing multiple-channeled optical signals by utilizing an optical interference filter which is given wavelength selectivity by using a wedge shaped optical block 20 to have a light multiply-reflected and to vary such as incident angles thereof.

### The Present Claimed Invention Patentably Distinguishes Over the Prior Art

Claim 1 as amended recites that the third optical multiplexing means comprises an interleaver having two input ports and one output port and having periodic filter characteristics

for each of the input ports. This interleaver structure differs from the wavelength selected filter disclosed by Hendrix and from the polarization combiner 315 disclosed by Bergano which does not disclose that each input port has periodic filtering characteristics. In addition, the claimed interleaver of the present invention is typically a low cost device compared with the polarization combiner used in Bergano or the narrow band pass periodic filter shown in Hendrix. Therefore, the present claimed invention produces significant advantages with respect to cost reduction for an optical multiplexing apparatus that can be achieved by using the claimed interleaver.

In summary, it is submitted that the prior art does not teach or suggest the claimed optical multiplexing apparatus of claim 1:

wherein said third optical multiplexing means comprises an interleaver including two input ports which correspond to said first and second input units, and including one output port corresponding to said output unit, and having periodic filter characteristics for each of said input ports.

Therefore, it is submitted that claim 1 patentably distinguishes over the prior art.

Referring to claim 4, it is submitted that the prior art does not teach the method of claim 4 which includes:

using an interleaver having two input ports and one output port;  
filtering the optical signals multiplexed by said first optical multiplexing step in accordance with periodic filter characteristics of one input port of said interleaver that include a transmission wavelength band with the wavelengths of odd numbers as centers, and having a band width of said transmission wavelength band which is narrower than the band width of the transmission wavelength band of filter characteristics of said first optical multiplexing step;

filtering the optical signals multiplexed by said second optical multiplexing means in accordance with periodic filter characteristics of the other input port of said interleaver that

include a transmission wavelength band with the wavelengths of even numbers as centers, and having a band width of the transmission wavelength band which is narrower than the band width of the transmission wavelength band of filter characteristics of said second optical multiplexing step; and

multiplexing the respective filtered optical signals to output the multiplexed signal light from said output port of said interleaver.”

Therefore, it is submitted that claim 4 patentably distinguishes over the prior art.

Claims 2 and 3 depend from claim 1 and include all of the features of that claim plus additional features which are not taught or suggested by the prior art. Therefore, it is submitted that claims 2 and 3 patentably distinguish over the prior art.

#### New Claim 5

New claim 5 recites:

an interleaver to multiplex the multiplexed odd wavelength optical signals and the multiplexed even wavelength optical signals to produce multiplexed signal light, said interleaver including:

a first input port having first periodic filter characteristics, to receive the multiplexed odd wavelength optical signals;

a second input port having second periodic filter characteristics, to receive the multiplexed even wavelength optical signals; and

an output port to output the multiplexed signal light.

Therefore, it is submitted that claim 5 patentably distinguishes over the prior art.

Previously Filed Information Disclosure Statement

Applicants submitted an Information Disclosure Statement together with cited references at the time the application was filed. It is noted that there is no indication that the Examiner has reviewed this Information Disclosure Statement. Accordingly, a copies of the Information Disclosure Statement together with the stamped postcard receipt and the cited references are attached. It is requested that the Examiner review these references and initial the PTO Form 1449 to make them of record in the subject application.

Summary

It is submitted that none of the references, either taken alone or in combination teach the present claimed invention. Thus, claims 1-5 are deemed to be in a condition suitable for allowance. Reconsideration of the claims and an early notice of allowance are earnestly solicited.

Respectfully submitted,

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